

AIR QUALITY PERMIT

Issued To: Devon Energy Production Company, L.P. Permit: #3883-00
P.O. Box 2606 Application Complete: 09/21/06
Clear Creek Road Preliminary Determination Issued: 10/02/06
Havre, MT 59501 Department's Decision Issued: 10/18/06
Permit Final: 11/03/06
AFS: #777-3883

An air quality permit, with conditions, is hereby granted to Devon Energy Production Company, L.P. (Devon), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

Permit #3883-00 is issued to Devon for the operation of a portable natural gas compressor engine at various locations throughout Montana. A further description of the permitted equipment is contained in Section I.A of the Permit Analysis.

B. Plant Location

The compressor engine will originally be located approximately 15 miles north of Havre, Montana, in the NE¼ of Section 26, Township 32 North, Range 17 East, in Hill County, Montana. However, Permit #3883-00 applies while operating at any location in Montana, except within those areas having a Department of Environmental Quality (Department)-approved permitting program or those areas considered tribal lands. *A Missoula County air quality permit will be required for locations within Missoula County, Montana.*

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Devon shall operate a 4-stroke rich-burn engine. The maximum rated design capacity of the engine shall not exceed 400-brake horsepower (bhp) (ARM 17.8.749).
2. Devon shall control the portable compressor engine with a non-selective catalytic reduction (NSCR) unit and an air-to-fuel (AFR) controller. The pound per hour (lb/hr) emission limits for the engine shall be determined using the following equation and pollutant specific grams per brake horsepower-hour (g/bhp-hr) emission factors (ARM 17.8.752):

Equation

Emission Limit (lb/hr) = Emission Factor (g/bhp-hr) * maximum rated design capacity of engine (bhp) * 0.002205 lb/g

Emission Factors

Nitrogen Oxides (NO _x)	1.0 g/bhp-hr
Carbon Monoxide (CO)	1.0 g/bhp-hr
Volatile Organic Compounds (VOC)	1.0 g/bhp-hr

3. Devon shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over six consecutive minutes (ARM 17.8.304).
4. Devon shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter to prevent visible fugitive emissions that exhibit an opacity of 20% or greater (ARM 17.8.308 and ARM 17.8.752).
5. Devon shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant areas with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.4 (ARM 17.8.749).
6. If the permitted equipment is used in conjunction with any other equipment owned or operated by Devon, at the same site, production shall be limited to correspond with an emission level that does not exceed 250 tons of emissions during any rolling 12-month time period. Any calculations used to establish production levels shall be approved by the Department (ARM 17.8.749).

B. Testing Requirements

1. Devon shall initially test the portable compressor engine for NO_x and CO, concurrently, to demonstrate compliance with the emission limits contained in Section II.A.2. The initial source testing shall be conducted within 180 days of the initial start up date of the compressor engine. After the initial source test, additional testing shall continue on an every four-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and ARM 17.8.749).
2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
3. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. If this portable compressor engine is moved to another location, an Intent to Transfer Form must be sent to the Department. In addition, a Public Notice Form for Change of Location must be published in a newspaper of general circulation in the area to which the transfer is to be made, at least 15 days prior to the move. The Intent to Transfer Form and the proof of publication (affidavit) of the Public Notice Form for Change of Location must be submitted to the Department prior to the move. These forms are available from the Department (ARM 17.8.765).
2. Devon shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis. Production information shall be gathered, by location, on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

3. Devon shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
4. All records compiled in accordance with this permit must be maintained by Devon as a permanent business record for at least five years following the date of the measurement, must be available for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

D. Notification

1. Devon shall provide the Department with written notification of commencement of construction, including purchase and installation, of the portable compressor engine within 30 days after commencement of construction (ARM 17.8.749).
2. Devon shall provide the Department with written notification of the actual start-up date of the compressor engine within 15 days after the actual start-up date at each location (ARM 17.8.749).

SECTION III: General Conditions

- A. Inspection – Devon shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Devon fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Devon of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s

decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Devon may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within three years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).
- I. The Department may modify the conditions of this permit based on local conditions of any future site. These factors may include, but are not limited to, local terrain, meteorological conditions, proximity to residences, etc.
- J. Devon shall comply with the conditions contained in this permit while operating at any location in Montana, except within those areas having a Department-approved permitting program.

PERMIT ANALYSIS
Devon Energy Production Company, L.P.
Permit #3883-00

I. Introduction/Process Description

Devon Energy Production Company, L.P. (Devon) is permitted for the operation of a portable compressor engine. The facility is a portable natural gas compressor station that will originally be located approximately 8 miles east-southeast of Havre, Montana, in the NE¼ of Section 26, Township 32 North, Range 17 East, in Hill County, Montana. Permit #3883-00 will apply to the source while operating at any location in Montana, except within those areas having a Department of Environmental Quality (Department)-approved permitting program or those areas considered tribal lands. *A Missoula County air quality permit will be required for locations within Missoula County, Montana*

A. Permitted Equipment

The facility consists of a portable natural gas compressor engine, with a maximum rated design capacity of 400-brake horsepower (bhp). The engine is a 4-stroke rich-burn engine controlled by a non-selective catalytic reduction (NSCR) unit and an air-to-fuel (AFR) controller.

B. Source Description

The portable compressor engine gathers and compresses natural gas from the nearby gas field. The natural gas fired compressor engine provides additional compression and boost to the gas for transmission through the pipeline.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

Devon shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than four hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter (PM)
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for Particulate Matter with an Aerodynamic Diameter of 10 Microns or Less (PM₁₀)

Devon must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over six consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Devon shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of one pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. Devon will utilize natural gas for operating its fuel burning equipment, which will meet this limitation.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR 60, including the definition of a natural gas processing plant defined in 40 CFR 60, Subpart KKK.
8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. A major Hazardous Air Pollutant (HAP) source, as defined and applied in 40 CFR 63, shall comply with the requirements of 40 CFR 63, as applicable, including the following subparts:
 - 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities.
 - 40 CFR 63, Subpart HHH National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities.
 - 40 CFR 63, Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines.

Based on the information submitted by Devon, the facility is not subject to the provisions of 40 CFR Part 63, because the facility is not a major source of HAPs.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.402 Requirements. Devon must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed heights of the new or altered stacks for Devon are below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Devon submitted the appropriate permit application fee for the current permit action.
2. ARM 17.8.505 Air Quality Permit Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

- F. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:
1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
 2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. Devon's portable compressor engine has a PTE greater than 25 tons per year of carbon monoxide (CO); therefore, an air quality permit is required.
 3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
 4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
 5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. Devon submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Devon submitted an affidavit of publication of public notice for the September 15, 2006, issue of the *Havre Daily News*, a newspaper of general circulation in the City of Havre, in Hill County, as proof of compliance with the public notice requirements.
 6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
 7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology (BACT) shall be utilized. The BACT analysis is included in Section III of this Permit Analysis.
 8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
 9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Devon of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an Environmental Impact Statement.
 11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than one year after the permit is issued.
 12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
 13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
 14. ARM 17.8.765 Transfer of Permit. (1) This rule states that an air quality permit may be transferred from one location to another if the Department receives a complete notice of Intent to Transfer location, the facility will operate in the new location for less than 1 year, the facility will comply with the FCAA and the Clean Air Act of Montana, and the facility complies with other applicable rules. (2) This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.
- G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
 2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
 - a. PTE > 100 tons/year of any pollutant;
 - b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - c. PTE > 70 tons/year of PM₁₀ in a serious PM₁₀ nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3883-00 for Devon, the following conclusions were made:
 - a. The facility's PTE is less than 100 tons/year for any pollutant.
 - b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.
 - c. This source is not located in a serious PM₁₀ nonattainment area.
 - d. This facility is not subject to any current NSPS.
 - e. This facility is not subject to any current NESHAP standards.
 - f. This source is not a Title IV affected source, or a solid waste combustion unit.
 - g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that the portable compressor engine is a minor source of emissions as defined under Title V.

III. BACT Determination

A BACT determination is required for each new or altered source. Devon shall install on the new or altered source the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized. A BACT analysis was submitted by Devon in Permit Application #3883-00, addressing available methods of controlling emissions from the portable natural gas compressor engine. The Department reviewed these methods, as well as previous BACT determinations in order to make the following BACT determination.

A. CO BACT

As part of the CO BACT analyses, the following control technologies were reviewed:

- Lean-burn engine with a catalytic oxidation unit and an air-to-fuel ratio (AFR) controller
- Lean-burn engine with an NSCR unit and AFR controller
- Lean-burn engine with no additional controls
- Rich-burn engine with an NSCR unit and an AFR controller
- Rich-burn engine with a catalytic oxidation unit and an AFR controller
- Rich-burn engine with no additional controls

Catalytic oxidation applied to a rich-burn engine is technically infeasible because the oxygen concentration from a rich-burn engine is not high enough for a catalytic oxidizer to operate properly. An NSCR unit applied to a lean-burn engine or lean-burn retrofit engine is also technically infeasible because the NSCR unit needs a rich fuel-to-air ratio to operate effectively. Lastly, according to information supplied in the application, lean-burn compressor engines under 400 hp are not produced, therefore all lean-burn engine options are not technically feasible.

Technically feasible control options, in order of the highest control efficiency to the lowest control efficiency, include:

Control Technology	% Control	CO Emission Rate (g/bhp-hr)
Rich-Burn with NSCR and AFR	80 – 90%	1.0
Rich-Burn without Control or with only AFR	--	8.0

Rich-burn engines using NSCR and AFR are widely used; these control options have little potential for adverse environmental and energy impacts and together are the most cost-effective method to control CO emissions. The Department determined that a 400-hp rich-burn engine with an NSCR unit and AFR controller, with an emission limit of 0.88lb/hr, which corresponds to an emission factor of 1.0 grams per brake horsepower-hour (g/bhp-hr) is BACT. A rich-burn engine equipped with an NSCR unit and an AFR controller is frequently used in the natural gas compression industry and the BACT determination is consistent with other recently permitted similar sources.

B. NO_x BACT

As part of the NO_x BACT analyses, the following control technologies were reviewed:

- Lean-burn engine with an SCR unit and AFR controller
- Lean-burn engine with an NSCR unit and AFR controller
- Lean-burn engine with no additional controls
- Rich-burn engine with an NSCR unit and an AFR controller
- Rich-burn engine with an SCR and an AFR controller
- Rich-burn engine with no additional controls

SCR applied to rich-burn engines is technically infeasible because the oxygen concentration from rich-burn engines is not high enough for an SCR to operate properly. Furthermore, adverse environmental impacts could occur with an SCR unit operating on lean-burn engines at variable loads as required by a typical compressor engine. SCR units are typically installed on process units that have a constant or low variability in load fluctuation. When engine load changes excess ammonia (ammonia slip) may pass through the system and out the stack or not enough ammonia will be injected. SCR units are technically infeasible because of the potential adverse environmental impacts from the typical load fluctuations that are required for compressor engines. SCR units have not been installed on lean-burn compressor engines in Montana.

NSCR on lean-burn engines is technically infeasible because the engine must burn a rich-fuel mixture for the NSCR to properly operate. Also, according to information supplied in the application, lean-burn compressor engines under 400 hp are not produced. Therefore, lean-burn engines are not technically feasible for this application.

Technically feasible control options, in order of the highest control efficiency to the lowest control efficiency, include:

Control Technology	% Control	NO _x Emission Rate (g/bhp-hr)
Rich-Burn with NSCR and AFR or NSCR only	80% - 90%	1.0
Rich-Burn without Control	--	16

Rich-burn engines using NSCR and AFR are widely used. These control options have little potential for adverse environmental and energy impacts and together are the most cost-effective method to control NO_x emissions. The Department determined that a 400-hp rich-burn engine with an NSCR unit and AFR controller, with an emission limit of 0.88 lb/hr, which corresponds to an emission factor of 1.0 grams per brake horsepower-hour (g/bhp-hr) is BACT. A rich-burn engine equipped with an NSCR unit and an AFR controller is frequently used in the natural gas compression industry and the BACT determination is consistent with other recently permitted similar sources.

C. VOC BACT

The Department determined that a 4-stroke rich-burn engine equipped with an NSCR unit and an AFR controller, with an emission limit of 0.88 lb/hr VOC, with a corresponding emission factor of 1.0 g/bhp-hr, is BACT.

D. PM₁₀ and SO₂ BACT

The Department is not aware of any BACT determinations that have required controls for PM₁₀ or sulfur dioxide (SO₂) emissions from natural gas fired compressor engines. Devon proposed no additional controls and burning pipeline quality natural gas as BACT for PM₁₀ and SO₂ emissions from the proposed compressor engine. Due to the relatively small amount of PM₁₀ and SO₂ emissions from the proposed engine and the cost of adding additional control, any add-on controls would be cost prohibitive. Therefore, the Department concurred with Devon's BACT proposal and determined that no additional controls and burning pipeline quality natural gas will constitute BACT for PM₁₀ and SO₂ emissions from the compressor engine.

The control options selected contain control equipment and costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

Ton/year (After Control)					
Source	PM ₁₀	NO _x	VOC	CO	SO _x
400-bhp Rich-Burn Engine	0.14	3.86	3.86	3.86	0.00
FACILITY TOTAL	0.14	3.86	3.86	3.86	0.00

400-bhp 4-Stroke Rich Burn Compressor Engine with NSCR and AFR

Brake Horsepower: 400 bhp
 Fuel Consumption: 3.04 MMBTU/hr
 Hours of operation: 8,760 hr/yr

PM/PM₁₀ Emissions (Filterable & Condensable)

Emission Factor: 9.50E-03 lb/MMBtu (AP-42, Chapter 3, Table 3.2-3, 7/00)
 Fuel Consumption: 3.04 MMBtu/hr (Maximum Design)
 Calculations: 3.04 MMBtu/hr * 9.50E-03 lb/MMBtu = 0.03 lb/hr
 0.03 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.14 ton/yr

NO_x Emissions

Emission factor: 1.0 gram/bhp-hour (BACT Determination)
Calculations: $1.0 \text{ gram/bhp-hour} * 400 \text{ hp} * 0.002205 \text{ lb/gram} = 0.88 \text{ lb/hr}$
 $0.88 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.86 \text{ ton/yr}$

VOC Emissions

Emission factor: 1.0 gram/bhp-hour (BACT Determination)
Calculations: $1.0 \text{ gram/bhp-hour} * 400 \text{ hp} * 0.002205 \text{ lb/gram} = 0.88 \text{ lb/hr}$
 $0.88 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.86 \text{ ton/yr}$

CO Emissions

Emission factor: 1.0 gram/bhp-hour (BACT Determination)
Calculations: $1.0 \text{ gram/bhp-hour} * 400 \text{ hp} * 0.002205 \text{ lb/gram} = 0.88 \text{ lb/hr}$
 $0.88 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.86 \text{ ton/yr}$

SO₂ Emission

Emission factor: 5.88E-04 lb/MMBtu (AP-42, Chapter 3, Table 3.2-3, 7/00)
Fuel Consumption: 3.04 MMBtu/hr (Maximum Design)
Calculations: $3.04 \text{ MMBtu/hr} * 5.88\text{E-}04 \text{ lb/MMBtu} = 0.00 \text{ lb/hr}$
 $0.00 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

V. Existing Air Quality

Permit #3883-00 is issued for the operation of a portable compressor engine to be originally located approximately 15 miles north of Havre, Montana, in the NE¼ of Section 26, Township 32 North, Range 17 East, in Hill County, Montana. This facility would be allowed to operate at this proposed site and any other areas in Montana, excluding those counties that have a Department-approved permitting program or those areas considered Tribal Lands. *A Missoula County air quality permit would be required for locations within Missoula County, Montana.*

VI. Ambient Air Impact Analysis

This permit is for a portable compressor engine to be located at various locations around Montana. This permit contains operational conditions and limitations that would protect air quality for this site and the surrounding area. Also, this facility is a portable source that would operate on an intermittent and temporary basis, so any effects to air quality will be minor and short-lived. Further, the amount of controlled pollutants, including NO_x and CO, should not cause concentrations in the ambient air that exceed the set standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

An Environmental Assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Devon Energy Production Company, L.P.
P.O. Box 2606
Clear Creek Road
Havre, MT 59501

Air Quality Permit Number: 3883-00

Preliminary Determination Issued: October 2, 2006

Department Decision Issued: October 18, 2006

Permit Final: November 3, 2006

1. *Legal Description of Site:* Devon will originally be located approximately 8 miles east-southeast of Havre, Montana, in the NE¼ of Section 26, Township 32 North, Range 17 East, in Hill County, Montana.
2. *Description of Project:* Devon proposes to operate a portable natural gas compressor engine. The engine will be a 400-bhp four-stroke rich-burn engine with NSCR and AFR.
3. *Objectives of Project:* The proposed project would supplement the applicant's ability to gather and compress natural gas for transmission through the pipeline.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the Montana Air Quality Permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Devon demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in Permit #3883-00.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and to demonstrate compliance with those requirements and would not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites			X			Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department:

A. Terrestrial and Aquatic Life and Habitats

Minor impacts to terrestrial and aquatic life and habitats would be expected from the proposed project because animals would potentially use the area around the facility and because the facility would be a source of air pollutants. The facility would emit air pollutants and corresponding deposition of pollutants would occur; however, the Department determined that any impacts from deposition would be minor (as discussed in Section 7.F of this EA). In addition, minor land disturbance would occur from moving and installing the compressor. Overall, any impacts to terrestrial and aquatic life and habitats would be minor.

B. Water Quality, Quantity, and Distribution

Minor impacts would be expected on water quality, quantity, and distribution from the proposed project. The facility would have no direct discharges into surface water and the impacts to water quality, quantity, and distribution from installing the compressor should be minor. However, water may be required to control fugitive dust emissions from the access roads and the general facility property. In addition, the facility would emit air pollutants and corresponding deposition of pollutants would occur (as discussed in Section 7.F of this EA). However, the Department determined because of the relative size of the facility that any impact on water quality, quantity, and distribution would be minor.

C. Geology and Soil Quality, Stability, and Moisture

Minor impacts would occur on the geology and soil quality, stability, and moisture from the proposed project because of minor disturbances while installing the compressor. No discharges, other than air emissions, would occur at the facility. While deposition of pollutants would occur, any impacts resulting from the deposition of pollutants on the soils surrounding the site would be minor (as discussed in Section 7.F of this EA). Overall, any impacts to the geology and soil quality, stability, and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality

Minor impacts would occur on vegetation cover, quantity, and quality because some disturbance would occur while installing the compressor. There would be no water discharges from the facility. However, the facility would be a source of air pollutants and corresponding deposition of pollutants would occur. The Department determined that any impacts resulting from the deposition of pollutants on the existing vegetation cover, quantity, and quality would be minor (as discussed in Section 7.F of this EA). Overall, any impacts to vegetation cover, quantity, and quality would be minor.

E. Aesthetics

Minor impacts would result on the aesthetic values of the area because the compressor is a new source. However, any visual aesthetic impacts would be minor because the compressor is small and would be located next to an existing pipeline site. The facility would also create additional noise in the area. However, any auditory aesthetic impacts would be minor because the compressor engine is small. Overall, any aesthetic impacts would be minor.

F. Air Quality

The air quality of the area would realize minor impacts from the proposed project because the facility would emit the following air pollutants: NO_x; CO; VOC, including HAPs; and extremely small amounts of PM₁₀ and sulfur oxides (SO_x). Air emissions from the facility would be minimized by limitations and conditions that would be included in Permit #3883-00. Conditions would include, but would not be limited to, BACT emission limits and opacity limitations on the proposed engine.

Pollutant deposition from the facility would be minimal because the pollutants emitted would be well controlled, widely dispersed (from factors such as wind speed and wind direction), and would have minimal deposition on the surrounding area. Since the controlled emissions would not exceed any Montana ambient air quality-modeling threshold, the Department believes that controlled emissions from the source would not cause or contribute to a violation of any ambient air quality standard. Therefore, the Department determined that any air quality impacts from the proposed project would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

In an effort to identify any unique endangered, fragile, or limited environmental resources in the area, the Department contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). The NRIS search identified one species of special concern, Baird's Sparrow, located over one mile from the proposed project area. In addition, the Inferred Extent of the Greater Sage-grouse habitat is located over one mile from the proposed project area. Due to the minor amounts of construction that would be required, the relatively low levels of pollutants that would be emitted, and because the controlled emissions from the source will not cause or contribute to a violation of any ambient air quality standard, the Department determined that it would be unlikely that the proposed project would impact any species of special concern and that any potential impacts would be minor.

H. Demands on Environmental Resources of Water, Air, and Energy

The proposed project would have minor impacts on the demands for water because the facility may use water for dust suppression. Demands on air would be minor, because the facility would be a minor source of air pollutants. Deposition of pollutants would occur as a result of operating the facility; however, the Department determined that any impacts from deposition of pollutants would be minor (as discussed in Section 7.F of this EA).

The proposed project would be expected to have minor impacts on the demand for energy because the compressor engine would combust natural gas. The impact on the demand for the non-renewable energy resource would be minor because the facility would be relatively small by industrial standards. Overall, the impacts for the demands on the environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

In an effort to identify any historical and archaeological sites near the proposed project area, the Department contacted the Montana Historical Society, State Historic Preservation Office (SHPO). Search results concluded that there are no previously recorded historical or archaeological resources of concern within the area proposed for initial operations. According to the Montana State Historic Preservation Office, there would be a low likelihood of adverse disturbance to any known archaeological or historic site. Therefore, no impacts upon historical or archaeological sites would be expected as a result of operating the proposed portable compressor.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts on the physical and biological aspects of the human environment in the immediate area would be minor due to the relatively small size of the project and negligible construction activities associated with this type of facility. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3883-00.

Additional facilities (compressor stations, gas plants, etc.) could locate in the area to withdraw natural gas from the nearby area and/or to separate the components of natural gas. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Environmental impacts from any future facilities would be assessed through the appropriate permitting process.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue				X		Yes
D	Agricultural or Industrial Production			X			Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department:

- A. Social Structures and Mores
- B. Cultural Uniqueness and Diversity

The portable compressor would cause no disruption to the social structures and mores or cultural uniqueness and diversity in the area because the source would be a minor industrial source of emissions, and would only have temporary operations at this location. Further, the facility would be required to operate according to the conditions that would be placed in Permit #3883-00, which would limit the effects.

- C. Local and State Tax Base and Tax Revenue

The proposed project should not result in any impacts to the local and state tax base and tax revenue because the facility would be a minor industrial source of emissions and would have only temporary operations. The facility would not require any additional employees.

- D. Agricultural or Industrial Production

The land at the proposed location is grazing land with native grass cover. The proposed project could result in minor impacts to the surrounding vegetation cover, quantity, and quality; however, since the facility is a temporary source operating at existing sites and will have only a very small amount of emissions, the impacts should be minor.

The proposed project would have minor impacts to industrial production because the proposed project would facilitate natural gas compression in the pipeline. Additional facilities (compressor stations, gas plants, etc.) could locate in the area to withdraw natural gas from the nearby area and/or to separate the components of natural gas. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Environmental impacts from any future facilities would be assessed through the appropriate permitting process. The Department is not aware of plans for any additional facilities at this time. Overall, any impacts to agricultural or industrial production of the area would be minor.

- E. Human Health

The proposed project would result in minor, if any, impacts to human health. Deposition of pollutants would occur; however, the Department determined that the proposed project would comply with all applicable air quality rules, regulations, and standards. These rules, regulations, and standards are designed to be protective of human health. Overall, any impacts to public health would be minor.

- F. Access to and Quality of Recreational and Wilderness Activities

The proposed project would have minor, if any, impacts on access to recreational and wilderness activities because of the relatively remote location, small size, and temporary nature of the facility. The Lake Thibadeau National Wildlife Refuge is located approximately 1 mile west of the site. The proposed project would have minor impacts on the quality of recreational and wilderness activities in the area because the facility, while relatively small by industrial standards, would be visible and would produce noise. Overall, any impacts to the access and quality of recreational and wilderness activities in the area would be minor.

- G. Quantity and Distribution of Employment
- H. Distribution of Population

The portable compressor is a temporary source that supplements compression for the natural gas pipeline. The proposed project will have no impact on the employment and population because no additional employees are required.

- I. Demands for Government Services

There would be minor impacts on the demands for government services because additional time would be required by government agencies to issue the appropriate permits for the facility and to assure compliance with applicable rules, standards, and conditions that would be contained in those permits. Overall, any demands for government services to regulate the facility or activities associated with the facility would be minor due to the relatively small size of the facility.

- J. Industrial and Commercial Activity

Only minor impacts would be expected on the local industrial and commercial activity because the proposed project would represent only a minor increase in the industrial and commercial activity in the area. The proposed project would be relatively small and would take place at a relatively remote location.

Additional facilities (compressor stations, gas plants, etc.) could locate in the area to withdraw natural gas from the nearby area and/or to separate the components of natural gas. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Environmental impacts from any future facilities would be assessed through the appropriate permitting process. Overall, any impacts to the local industrial and commercial activity of the area would be minor.

- K. Locally Adopted Environmental Plans and Goals

The Department is unaware of any locally adopted environmental plans or goals. The permit would ensure compliance with state standards and goals. The state standards would protect the proposed site and the environment surrounding the site.

- L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social aspects of the human environment in the immediate area. Due to the relatively small size of the project, the industrial production, and tax revenue (etc.) impacts resulting from the proposed project would be minor. In addition, the Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3883-00.

Additional facilities (compressor stations, gas plants, etc.) could locate in the area to withdraw natural gas from the nearby area and/or to separate the components of natural gas. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Environmental impacts from any future facilities would be assessed through the appropriate permitting process.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permit action is for the construction and operation of a natural gas gathering plant. Permit #3883-00 includes conditions and limitations to ensure the facility will operate in compliance with all applicable rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

EA prepared by: Julie Merkel

Date: September 21, 2006